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10 (Amended). A catalyst suitable for the hydroalkylation of an aromatic hydrocarbon comprising

- (a) MCM-22 zeolite;
- (b) ruthenium; and
- (c) tin or zinc.

Marked-up versions of the existing claims 7 and 10 showing the changes incorporated in the amended claims are attached on a separate sheet.

### REMARKS

Applicants respectfully request entry of this Amendment and reconsideration of this application, as amended.

Claims 7-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Del Rossi et al (U.S. Patent No. 5,108,969). In particular, the Examiner argues that Del Rossi et al disclose, at column 8, lines 17-46, a catalyst comprising MCM-22 having a Group VIII metal, preferably platinum, and tin thereon. In view of the amendments now to be entered into claims 7 and 10, this rejection is respectfully traversed.

Thus claim 7 is now limited to an aromatic hydroalkylation catalyst comprising a crystalline inorganic oxide material having a specified X-ray pattern, such as MCM-22, a first hydrogenation metal in the form of ruthenium and a second metal selected from zinc, tin, nickel and cobalt. Similarly, claim 10 is now limited to an aromatic hydroalkylation catalyst comprising MCM-22, ruthenium and tin or zinc. In contrast, Del Rossi et al are concerned with catalysts for converting C<sub>2</sub>-C<sub>12</sub> aliphatic compounds to olefins and aromatics, namely dehydrogenation catalysts. Moreover, although Applicant's agree that ruthenium is a Group VIII metal, the only metals listed in the relevant passage in column 8, lines 9-46 of Del Rossi et al are platinum, palladium, iridium, rhenium and rhodium. Ruthenium is not specifically disclosed in Del Rossi et al. However, to constitute an

anticipation, a reference must "clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing and combining various disclosures....". *In re Arkley*, 172 U.S.P.Q. 524, 526 (C.C.P.A. 1972). It is therefore respectfully submitted that the disclosure in Del Rossi et al fails to anticipate the amended claims 7 and 10.

In addition, it is clear from Examples 8-12, and in particular Table 1 on page 7, of the present application that the combinations of Ru/Sn and Ru/Zn with MCM-22 provide catalysts which are significantly more active and selective in the conversion of benzene to cyclohexylbenzene than, for example, the combination of Pt/Sn with MCM-22. It is therefore respectfully submitted that it would not have been obvious to one of ordinary skill in the art to arrive at the amended claims from the disclosure in Del Rossi et al.

Claims 7-10 also stand rejected under 35 U.S.C. § 102(b) as being anticipated by Dessau et al (U.S. Patent No. 5,292,976). In particular, the Examiner argues that Dessau et al disclose a catalyst comprising MCM-22 having platinum and tin thereon (column 7, lines 28-31). In view of the amendments now to be entered into claims 7 and 10, this rejection is respectfully traversed.

Thus the relevant passage in Dessau et al is concerned with a catalyst which effects naphtha conversion by aromatization/dehydrocyclization (see column 1, lines 7-11) and which includes platinum and tin or indium on a zeolite selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-20, ZSM-23, ZSM-48, ZSM-50, MCM-22 and zeolite beta. Not only are Dessau et al concerned with a different catalyst from that of the present invention using a large variety of possible zeolitic substrates, but also there is no disclosure or suggestion in Dessau et al of using ruthenium in the catalyst. It is therefore respectfully submitted that the disclosure in Dessau et al fails to anticipate the amended claims 7 and 10. Moreover, in view of the improved results obtained with Ru/Sn and Ru/Zn on MCM-22 as compared with Pt/Sn on MCM-22 in the conversion of

benzene to cyclohexylbenzene (see Examples 8-10), it is respectfully submitted that the amended claims are nonobvious over the disclosure in Dessau et al.

Entry of this Amendment and early allowance of this application is requested.

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

The following changes are being made to claims 7 and 10:

7 (Amended). A catalyst suitable for the hydroalkylation of an aromatic hydrocarbon comprising

- (a) a first metal having hydrogenation activity in the form of [and selected from palladium,] ruthenium[, nickel and cobalt];
- (b) a second metal[, different from the first metal, and] selected from zinc, tin, nickel and cobalt[.]; and
- c) a crystalline inorganic oxide material having a X-ray diffraction pattern including the following d-spacing maxima  $12.4\pm 0.25$ ,  $6.9\pm 0.15$ ,  $3.57\pm 0.07$  and  $3.42\pm 0.07$ .

10 (Amended). A catalyst suitable for the hydroalkylation of an aromatic hydrocarbon comprising

- (a) MCM-22 zeolite;
- (b) ruthenium [or palladium]; and
- (c) tin or zinc.